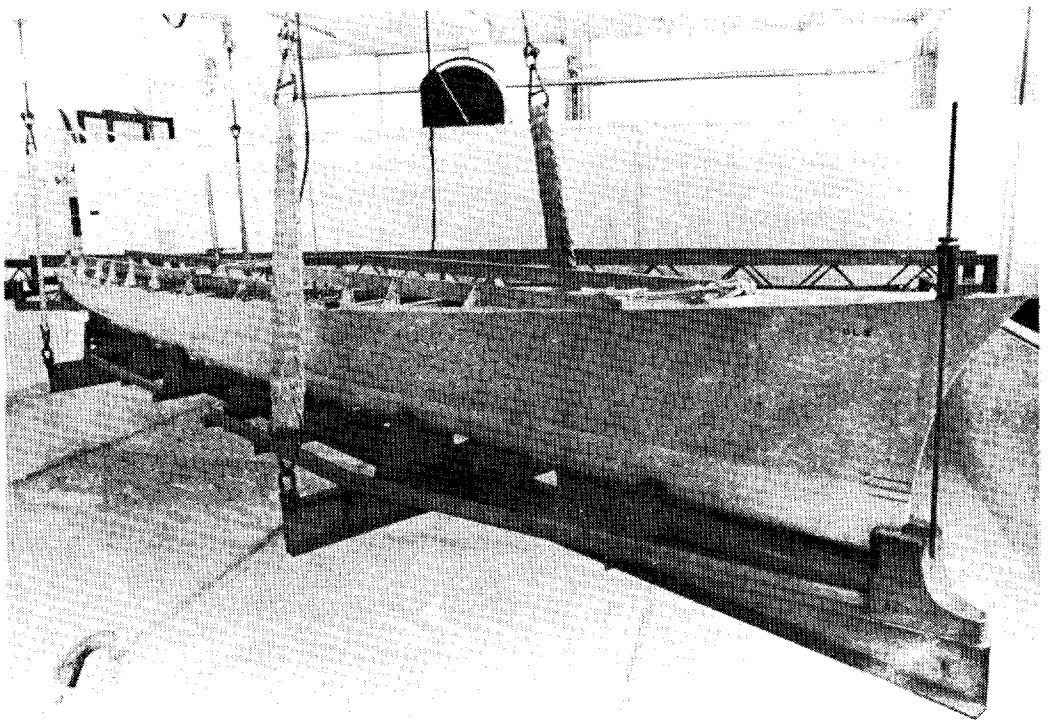

SHIP STABILITY MODEL (DL-2 CLASS) TRAINER, DEVICE 27B8

TRAINING CATEGORY:

SHIP STABILITY

ORIGINATING AGENCY:

CNET

SECURITY CLASSIFICATION:

Device 27B8 is unclassified.

INTENDED USE:

The device is used to study the transverse and longitudinal stability of surface ships. It demonstrates flooding and stability of ships in a damaged condition.

FUNCTIONAL DESCIPTION:

Device 27B8 consists of a DL-2 (DD-927 Class) destroyer hull model. It is constructed of fiberglass-reinforced plastic and contains compartments that are equipped with valved air vents on the deck and through-hull fittings (plugs) from the keel to the water-line. Other compartments accessible on the deck are designed to receive various sizes of movable lead weights which are to be used as solid ballasts.

The hull is first mounted on its dolly and is then lowered and positioned in the tank by means of the overhead crane. The straps are disconnected from the dolly. The tank is then filled with water and the hull is allowed to float. The dolly remains at the bottom of the tank.

When the hull is to be retrieved it is positioned over the dolly, and the water level is lowered until the hull rests on the dolly. The straps are then connected to the dolly and the overhead crane is used to remove the hull and dolly from the tank.

All experiments are conducted by first positioning the hull in the floatation tank.

The aluminum A-frame is secured to the model, and the pendulum and a scale (1 meter or 1 yard) are attached to the A-frame. A transversely movable weights dolly is mounted on the longitudinal tracks that run along the model's deck. As the weights dolly (with weights installed) is moved to known positions off the model centerline, the resulting list is indicated on the scale. As the experiment progresses, the students record these data. The pendulum bob hands freely in an oil bath,

which dampens its oscillations. When the inclining experiment is completed, the model is then sallied for measurement of natural rolling period.

The device is also used to experimentally determine the transverse righting arm of the model. A large aluminum slotted wheel is mounted on the model. A remote cable system is attached to the slotted wheel, thus allowing the model to be inclined to large angles of heel. Tension in the cable is measured as is angle of heel. These data can then be transformed into the curve of righting arm versus heel angle for the particular shape of the model.

In addition to the regularly performed experiments discussed, damage control exercise demonstrations may be performed by selectively flooding various compartments of the model. This is accomplished by opening flood vents and shifting solid ballast. For these demonstrations the model may be free-floating with no extra gear on board or may be rigged as described in previous paragraphs.

PHYSICAL INFORMATION:

The hull is 20' 7" long, has a height of 22" at the bow, 8" at the stern, 14" at midships, and has a 25" beam. The hull weighs approximately 800 lbs. and is scaled 1/24th size of the actual ship.

EQUIPMENT REQUIRED (NOT SUPPLIED):

1. Floatation tank 22' long, 18' wide, 4' deep, which will hold approximately 13,000 gallons of water.
2. Supporting dolly.
3. Overhead crane with a 1-ton capacity.
4. Aluminum A-frame and pendulum assembly.
5. Weights and weights dolly.
6. Transverse righting arm assembly.

INSTALLATION AREA:

The site must be equipped with adequate space and floor strength to accommodate the heavy floatation tank, filled with approximately 13,000 gallons of water. Connection to a supply of fresh water and a drain for the tank are required.

PUBLICATIONS FURNISHED:

Operation and Maintenance Instructions for Ship Stability Model (DL-2 Class) Trainer, Device 27B8, NAVTRADEV P-3822.

CONTRACT IDENTIFICATION:

Manufactured by Gibbs and Cox, Inc., New York, NY

LOCAL STOCK NUMBER:

6910-LL-C00-2069